

Under-Exploited Groundfish On the Nova Scotia Banks

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land at present. However, with increasing demand for food they may well become important for direct consumption or for conversion to fish protein concentrate (F.P.C.) or fish meal.

DATA FROM RESEARCH CRUISES

Over the past 10 years (1958-1968) the St. Andrews Station of the Fisheries Research Board of Canada has recorded the numbers of groundfish of every species caught during its research cruises. The fishing effort on the Nova Scotia Banks, in particular, has been spread over almost the whole of that area from depths of about 30 to 250 fathoms and over all seasons. The total catch of each species of fish, therefore, reflects the relative number of that species which is available to the otter trawl used. From this we can get an indication of the species which may be worth investigating as potential candidates for commercial exploitation in the future. By applying corrections for various factors, we can convert these figures to give us the weight of each species caught over any given length of time — weights are obviously more significant than numbers as indicators of the value of the catch. Table 1 lists the main species in order of weight caught per 100 hours fishing.

As would be expected, the list is headed by those fish which form the most important part of our commercial catches, but there are several surprises. All the main commercial species of

TABLE 1

Species	wt per 100 hours (lb)
Haddock	14,397
Argentine	9,191
Cod	8,311
Pollock	5,749
Redfish	4,459
Plaice	3,650
Silver hake	2,039
Witch	1,630
Yellowtail	1,554
Angler	1,273
Halibut	1,161
Common hake	1,092
Skates	1,056
Dogfish, spiny	780
Sculpin, longhorn	601
Squid	545
Wolffish	342
Cusk	332
Sea raven	46
Sand lance	44
Eelpout	38
Grenadier	21

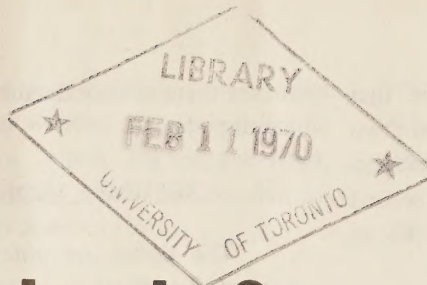
Catch rates of groundfish on FRB
research cruises, 1958-1968.

The population explosion is forcing man to search for new sources of food, with the sea as the main hope. However, contrary to what was believed up to the beginning of this century, the sea is not an inexhaustible source of fish and other food stuffs. If we are going to make best use of what it has to offer, we must realize that there are strict limitations on how much fish and other animals or plants we can remove for our use without destroying the stocks.

At present, our fisheries are based on the intensive fishing of comparatively few species: cod, haddock, redfish, herring, flatfish and a few others. Most of these are being very heavily exploited and some, such as the haddock, appear to be over-fished already. Since we are reaching the limits with these species, we must look elsewhere for additional supplies.

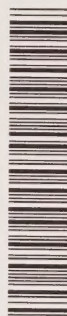
For the immediate future, we should have a look at other fish, those which are not fully exploited. They may not have great consumer appeal and many of them are unmarketable or uneconomical for the fisherman to

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groundfish are included in the first twelve places, but among these are two which do not appear in Canadian landing statistics: argentine, second only to haddock, and silver hake, at seventh place.

It is difficult to believe that there are more argentine than cod or redfish in the area. After all, cod is the most important constituent of commercial landings from the area and the commercial catch rates for cod are not very much lower than for haddock — cod 15.84, haddock 22.88 tons per 100 hours for large Canadian otter-trawlers in 1968.

SPECIAL STUDIES

The research cruise data appear to exaggerate the importance of haddock, argentine and silver hake. These are the three groundfish species on which special studies have been carried out in the past few years. Specific efforts to catch them may have inflated their comparative catch rates. Nevertheless, their importance is undoubted: haddock is the second most important species in the total commercial groundfish landings in the area; the USSR landed about 15,000 tons of argentine (and 11,000 tons of cod) from the banks in 1966; most spectacular of all, the USSR caught more than 123,000 tons of silver hake on the banks in 1963, although the catches have since declined to almost zero. For comparison, the Canadian cod landings in the area for 1966 and 1963 were 41,854 and 28,826 tons respectively.

The unused species in the bottom half of the list are headed by the angler (monkfish) and skates which together constitute 4% of the total catch. The remainder, all relatively minor items, nevertheless total 2,749 lb/100 hours (4.71% of total) which

makes them of considerable interest as a group.

SELDOM LANDED

The skates are potentially important for direct consumption as a source of F.P.C. but are seldom landed here, although the U.S.A. landed over 2,700 tons in 1966. Similarly, few anglers are landed by Canadians — 56 tons from the Nova Scotia Banks in 1966, as against 640 tons by USSR. The 56 tons represent only 0.01% of the total Canadian fish landings, although the research data indicate that anglers constitute 2.18% of the total catch — for each angler landed, 200 are thrown away!

Wolfish and cusk are acceptable in the markets at present, to a limited extent. The sculpins and sea raven are unattractive fish, awkward to handle and their future would seem to lie in fish meal and F.P.C., unlike eelpout which is used for direct consumption elsewhere. The grenadiers, or ratfish, are unimportant on the banks, but evidently abundant in deep water. As an indication of their potential, the Russians caught more than 28,000 tons off the Canadian coast in 1968.

There are three species which are of special interest: sand lance, spiny dogfish and squid. It is difficult to assess their importance as the catch figures in Table 1 may not reflect their true abundance.

Sand lance are known to occur in shallow water on the Nova Scotia Banks and sometimes in great concentrations. The Nova Scotia Department of Fisheries reported catches of up to 15 tons per 1/2-hour tow during experimental fishing operations by a small trawler in 1968. The fish are plankton feeders, not strictly groundfish, and so are not always available to

the bottom trawl. They constitute a very important part of the fisheries in the North Sea — more than 187,000 tons were landed for conversion to fish meal in 1967. There is sufficient evidence to justify further investigations into this resource off the Canadian coast.

Spiny dogfish have been caught in considerable quantities at times on the Nova Scotia Banks. They appear to come into shallow water in summer and retreat to deep, warmer waters in winter. They are plentiful off the New England coast and may be only summer visitors in the Nova Scotia area. As a resource they are of unknown value but merit serious investigation as a source of F.P.C. A survey of the fish stocks off the New England States places them third only to silver hake and herring.

SQUID PLENTIFUL

Finally, squid also are mainly summer visitors to the shallower waters on the banks. Evidence from echosounder traces and trawl-hauls suggests that the squid approach the Nova Scotia banks in immense numbers in spring and retreat in fall. They may well constitute the greatest fishery resource in the Northwest Atlantic, but it appears that special techniques may have to be developed to capture them efficiently.

On the basis of the figures in Table 1, at least one quarter of the available groundfish resources of the Nova Scotia banks are not used.

Why are so many of these species not sought by Canadians? It is not because they cannot be used. Silver hake has been important in the New England fisheries for many years, both for human consumption and industrial use. The Russians apparently regard

the argentine, a delicious smelt-like fish, as a reserve in case of decline in herring stocks. In other countries, dogfish, squid and sand launce support special fisheries, and skates and angler are very acceptable.

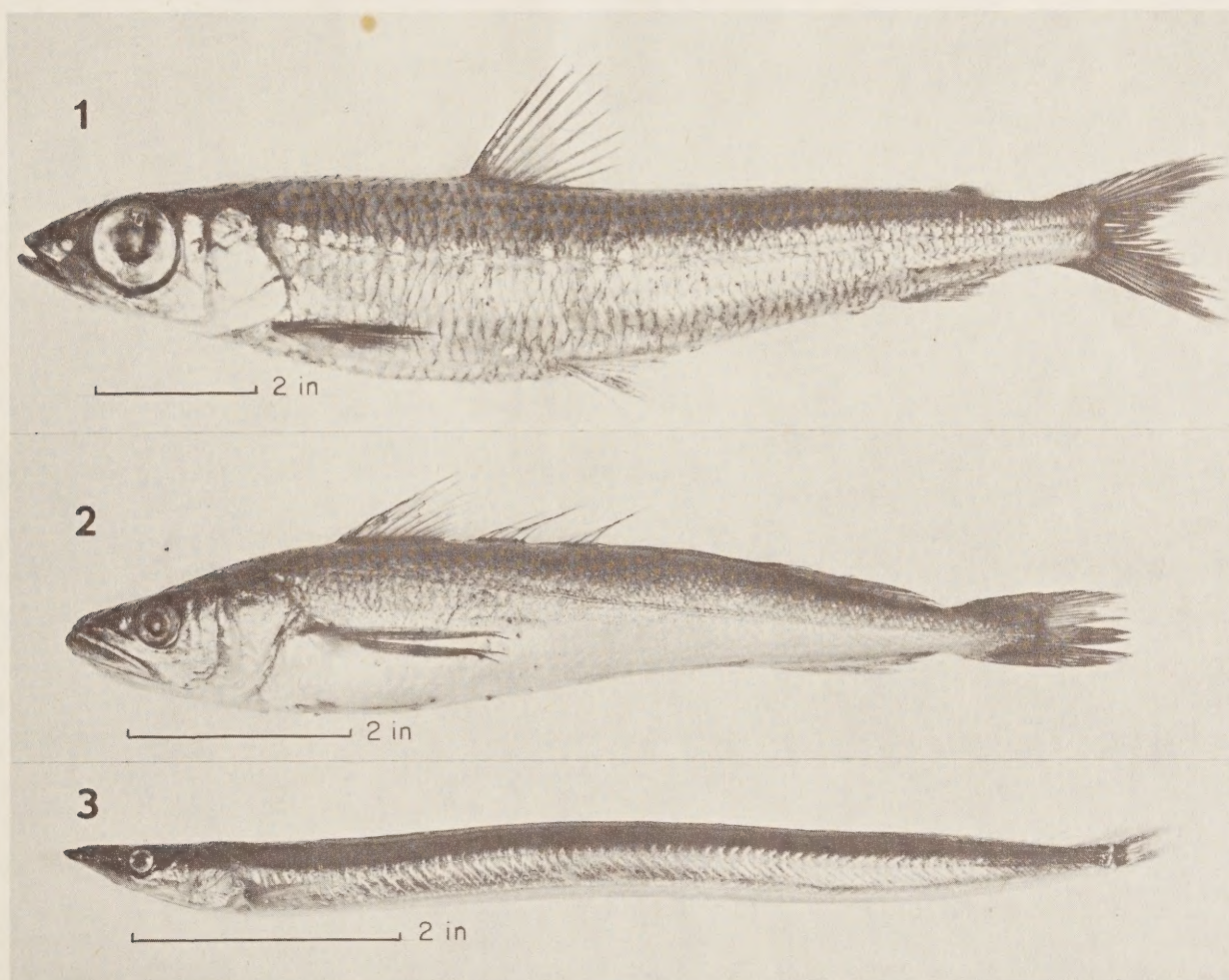
The Canadian fisherman obviously caters for a traditional market based on a handful of fish species. The market has changed a little in recent years with the development of new fishing and processing techniques, but it is still highly specialised. Increasing

competition, especially from east European nations, is endangering the stocks on which the market relies, and this may force the Canadian industry to diversify further.

So far as exploitation of new fish resources is concerned it is already years behind USSR. With increasing pressure on food resources, it is obvious that it will become impossible to ignore present unexploited species simply because they have not been used in the past or because there is no

consumer demand for them. Demand will be created by shortage of other fish.

While we recognize that a 25 per cent increase in fish landings, offered by rejected fish, will not solve the world's food problems, new, untapped resources such as squid, lantern fishes, krill and plankton might do a lot. Still, we need new techniques to replace uncontrolled, primitive hunting with planned production in order to make the most efficient use of our marine resources.



Three species of groundfish plentiful on the Nova Scotia Banks suggested as worth study for increased commercial exploitation: (1) Argentine (*Argentina silus*); (2) Silver hake (*Merluccius bilinearis*); (3) Northern sand launce (*Ammodytes dubius*).

